



Aviation Investigation Final Report

Location:	Chelan, Washington	Accident Number:	WPR17FA139
Date & Time:	July 1, 2017, 07:30 Local	Registration:	N492XB
Aircraft:	NORTH WING UUM INC SPORT X2 912	Aircraft Damage:	Destroyed
Defining Event:	Loss of control in flight	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The flight instructor and the student pilot were conducting a local flight in the weight-shift-control aircraft. An onboard camera captured the accident flight and showed that, at the time of the accident, the instructor was demonstrating a spiral dive maneuver. The video showed that the maneuver was initiated at an altitude that appears to be below 1,000 ft AGL which is a minimum required recovery altitude. During the maneuver, the aircraft's bank angle continued to increase until the aircraft entered a nearly-vertical descent and impacted terrain. Postaccident examination of the wreckage revealed no evidence of a preimpact mechanical malfunction or failure that would have precluded normal operation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The flight instructor's failure to maintain control of the aircraft while demonstrating a spiral dive, which resulted in a loss of control. Contributing to the accident was the instructor's decision to demonstrate a spiral dive maneuver at an altitude that was too low for recovery.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	(general) - Not attained/maintained
Personnel issues	Decision making/judgment - Pilot
Aircraft	Altitude - Not attained/maintained
Environmental issues	Mountainous/hilly terrain - Ability to respond/compensate

Factual Information

History of Flight

Maneuvering-low-alt flying	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On July 1, 2017, about 0730 Pacific daylight time, a North Wing Scout XC light sport weight-shift-control (WSC) aircraft, N492XB, was destroyed when it impacted mountainous terrain while maneuvering near Chelan, Washington. The flight instructor and student pilot sustained fatal injuries. The aircraft was owned by the flight instructor who was operating it under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed at the time of the accident, and no flight plan was filed for the local flight, which originated from Lake Chelan Airport (S10), Chelan, Washington, about 0630.

A review of video obtained from an onboard camera revealed that, earlier that morning, the student pilot completed a checkride to obtain a sport pilot certificate. The instructor informed the student pilot that he completed the checkride successfully. They subsequently departed again and continued to fly in the local area. Video showed that the pilots stayed in the traffic pattern before departing to the east. As the aircraft continued to climb away from the airport, the pilots discussed finding an area with less turbulence. About 19 minutes after takeoff for the accident flight, the instructor took over the flight controls and began to demonstrate a spiral dive. As he entered the maneuver, the aircraft's bank angle increased, and the aircraft rotated nearly 360° with its nose pointing straight down. The video stopped recording upon impact.

Pilot Information

Certificate:	Flight instructor; Private	Age:	70, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	Sport pilot	Toxicology Performed:	Yes
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	April 19, 2016
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	6000 hours (Total, all aircraft), 3012.8 hours (Total, this make and model)		

Student pilot Information

Certificate:	Student	Age:	48, Male
Airplane Rating(s):	None	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

The instructor, age 70, held a private pilot certificate with an airplane single-engine land rating and a flight instructor certificate for light sport aircraft. The pilot was issued a third-class Federal Aviation Administration (FAA) airman medical certificate on April 19, 2016, with a limitation that he must have available glasses for near vision. On the application for that medical certificate, the pilot reported 6,000 total hours of flight experience, of which 100 hours were in the previous six months. A review of the pilot's logbook revealed that he accumulated a total of 3,012.9 hours in the WSC trike category.

The student, age 48, held a student pilot certificate and was not required to possess an FAA airman medical certificate. The student's logbooks were not available for review, and his flight experience could not be determined.

Aircraft and Owner/Operator Information

Aircraft Make:	NORTH WING UUM INC	Registration:	N492XB
Model/Series:	SPORT X2 912 NO SERIES	Aircraft Category:	Airplane
Year of Manufacture:	2014	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	LS9014
Landing Gear Type:	Tricycle	Seats:	
Date/Type of Last Inspection:		Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	
Airframe Total Time:		Engine Manufacturer:	
ELT:		Engine Model/Series:	
Registered Owner:	On file	Rated Power:	
Operator:	On file	Operating Certificate(s) Held:	None

The aircraft was manufactured in 2014 and purchased by the instructor in May 2017. The aircraft's maintenance records were not located and its maintenance history could not be determined.

The aircraft was equipped with a Rotax 912 series, 80-horsepower reciprocating engine. The engine was situated behind the rear seat in a pusher-type arrangement. The engine was electronically controlled and drove a 3-blade composite propeller.

The primary pilot station was the front seat. The rear seat occupant has no access to instruments. Both front and rear seat occupants had access to the control bar. Evidence suggest that the pilot occupied the rear seat and the student the front seat.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KEAT,1229 ft msl	Distance from Accident Site:	34 Nautical Miles
Observation Time:	14:55 Local	Direction from Accident Site:	203°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	11 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	310°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.9 inches Hg	Temperature/Dew Point:	24°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	CHELAN, WA (S10)	Type of Flight Plan Filed:	None
Destination:	CHELAN, WA (S10)	Type of Clearance:	None
Departure Time:		Type of Airspace:	Class G

The 0655 automated observation at Pangborn Memorial Airport (EAT), Wenatchee, Washington, about 35 miles southwest of the accident site, included wind from 310°; at 11 knots, 10 miles visibility, temperature 24°C, dew point 9°C, and an altimeter setting of 29.91 inches of mercury.

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	47.920276,-119.86972

The aircraft impacted terrain near the top of a hill in mountainous, rocky terrain and was destroyed by

impact forces. The wreckage debris path was oriented on a heading about 130° magnetic. The first identified point of contact (FIPC) was a rock about 25 ft below the summit of the hill. The FIPC was characterized by an area of disturbed dirt surrounded by debris, including the front steering fork and the brake reservoir. A portion of the canopy was located left of the FIPC. The main wreckage, including most of the airframe, the engine, the wing, main landing gear, and propeller, was located about 50 ft from the FIPC on a heading of 320°, indicating that, following the impact, it rolled down the hill. One propeller blade was fractured and located about 30 ft north of the main wreckage. The rear seat was located within the main wreckage; the front seat was located along the debris path. Multiple separations throughout the flight control system were observed. All fracture surfaces were consistent with overload.

The engine cylinders, crankcase and overhead components were intact and displayed no evidence of catastrophic failure. Disassembly and examination of the engine revealed no evidence of abnormal wear or failure of internal components. Negligible impact damage was noted to the crankcase, reduction gear case, cylinders, and accessory section. Rocker arm, valve train, and accessory gear continuity was established by rotating the engine crankshaft by hand. All four cylinders developed pressure when the crankshaft was rotated. Internal examination of the pistons and cylinders using a lighted borescope revealed no anomalies. The piston faces and cylinder bores were clear and undamaged. The spark plugs were removed and displayed normal wear signatures. Impact damage was noted to both carburetors and the ignition system. Examination of the engine revealed no evidence of a preimpact mechanical malfunction or failure.

Medical and Pathological Information

The King County Medical Examiner, Seattle, Washington, performed an autopsy of the flight instructor and the student pilot. The cause of death for both individuals was listed as multiple blunt force injuries.

The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology on specimens from the instructor and the student pilot. Testing of specimens from the instructor detected ethanol in muscle and brain, propanol in muscle, and atorvastatin in liver. Ethanol is the intoxicant commonly found in beer, wine, and liquor. Ethanol may also be produced in body tissues by microbial activity after death. Atorvastatin (often called Lipitor) is a cholesterol-lowering agent. The drug is not considered impairing. The tests for cyanide and carbon monoxide were not performed. Testing of specimens of the student pilot detected ethanol in muscle but not in liver; no drugs were detected in muscle. The tests for cyanide and carbon monoxide were not performed.

Additional Information

Recovery from a Steep-banked Spiral Dive

According to the Weight-Shift Control Aircraft Flying Handbook (FAA-H-8083-5) Addendum, the purpose of practicing a steep spiral dive is to "build recognition of and a reflexive response to a steep-banked spiraling dive. Start all practice at an altitude that will permit a recovery at no lower than 1,000 feet above the ground (AGL). An altitude of at least 2,500 AGL is recommended... The pilot must be careful not to stall the aircraft or exceed airspeed limitations at all times."

Administrative Information

Investigator In Charge (IIC):	Smith, Maja
Additional Participating Persons:	Philip Griffis; FSDO; Spokane, WA Kamron Blevins; North Wing Inc; Chelan, WA
Original Publish Date:	July 8, 2019
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=95478

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).